

Keeping Watch

The new SOLAS regulation on long-range identification and tracking.

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The International Maritime Organization (IMO) Marine Safety Committee, at its 81st session in May 2006 (MSC 81), adopted long-awaited amendments to the Safety of Life at Sea Convention (SOLAS) for the long-range identification and tracking (LRIT) of ships.¹ The IMO Marine Safety Committee also approved performance standards and functional requirements for LRIT and established an ad hoc working group on the engineering aspects of long-range identification and tracking. The U.S. Coast Guard will be implementing the SOLAS regulation in concert with the performance standards through a number of initiatives.²

With the adoption of the SOLAS regulation, the Coast Guard is considering a plan to implement a national LRIT data center that could work independently before the SOLAS regulation enters into force 1 January 2008 and thereafter interoperate with the international LRIT data center and other national and regional LRIT data centers. In the interim, USCG is evaluating the feasibility of implementing a voluntary long-range vessel tracking system. The U.S. Coast Guard Operations Systems Center (OSC) is conducting a study to investigate and assess tracking methods currently in use, including automatic identification systems (AIS), The Automated Mutual Assistance Vessel Rescue (Amver), and vessel monitoring systems. In addition to developing technical capabilities, the Coast Guard is preparing to implement national regulations in concert with the new SOLAS regulation.

The SOLAS Regulation on LRIT

The United States has led the effort at IMO for adoption of a long-range identification and tracking SOLAS amendment since the December 12, 2002 diplomatic conference.³ The debate on long-range identification and tracking concluded at MSC 81 in May 2006, with

the committee crafting a delicately balanced package of regulations and performance standards to meet the needs of the IMO contracting governments.⁴

The new regulation 19-1 of SOLAS Chapter V (Safety of Navigation) enters into force on 1 January 2008, with most ships required to transmit LRIT information by 31 December 2008. Industry representatives and others voiced concern about the potential need to install, upgrade, or re-fit shipboard equipment by 1 January

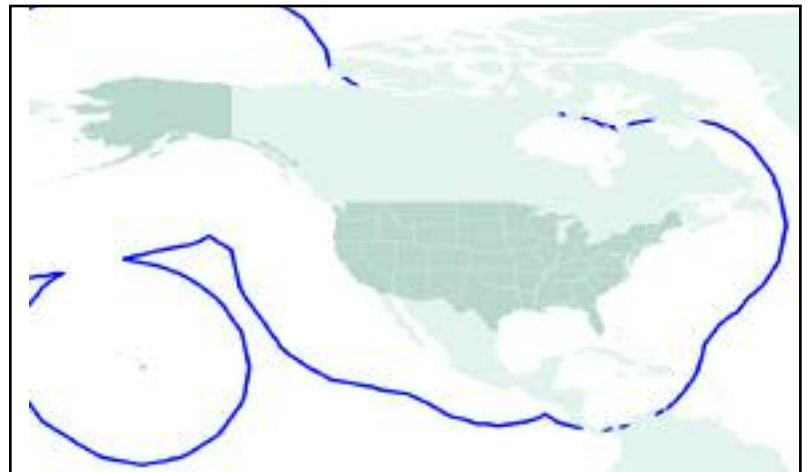


Figure 1: The 1,000-nautical-mile threshold from the U.S. coast. USCG graphic.

2008; hence the delay in the start of operations.⁵

The regulation requires cargo ships of 300 gross tons and above, passenger ships, and mobile offshore drilling units on international voyages to be fitted with a system to automatically transmit LRIT information. Ships that operate exclusively within sea area A1 (essentially within VHF range of shore) and fitted with an automatic identification system (AIS) are not required to comply with the regulation.⁶

Contracting governments, subject to certain restrictions, can receive LRIT information transmitted by ships as follows:

- **Flag states:** All flag ships worldwide.
- **Port states:** All ships indicating an intention to enter a port facility, at a distance or time set by the port state, but not in internal waters of another contracting government.
- **Coastal states:** All ships, regardless of flag, within a distance of 1,000 nautical miles of the coast, but not in internal waters of another contracting government, nor in the territorial sea of the contracting government whose flag the ship is entitled to fly.

Figure 1 indicates the vast tracking area to which the United States will have access, at the 1,000 nautical mile threshold established in the SOLAS regulation⁷ (blue line). This distance equates to roughly half of the 96-hour notice of arrival (at a ship speed of 20 knots).

Although the initial U.S. position regarding coastal state access to LRIT information was 2,000 nautical miles, the adoption of this regulation that includes coastal state access at 1,000 nautical miles is viewed as a great success for the IMO, the U.S., and all contracting governments.⁸

Administrations (the government of the state whose flag the ship is entitled to fly) may deny coastal states

access to LRIT information at any time. Despite the regulation's broad reach to 1,000 nautical miles for coastal states, it is important to note the first provision of the regulation:

"Nothing in this regulation or the provisions performance standards and functional requirements adopted by the Organization in relation to the long-range identification and tracking of ships shall prejudice the rights, jurisdiction or obligations of States under international law, in particular, the legal regimes of the high seas, the exclusive economic zone, the contiguous zone, the territorial seas or the straits used for international navigation and archipelagic sea lanes."⁹

Contracting governments must bear all costs for long-range identification and tracking information that they request and receive. A master of a ship may, for the protection of navigational information or when he considers LRIT operation may compromise the safety or security of his ship, switch off the LRIT shipboard equipment. Search and rescue (SAR) services of a contracting government may receive long-range identification and tracking information free of charge for SAR purposes.¹⁰

The Performance Standards and Functional Requirements for LRIT

The long-range identification and tracking performance standards and functional requirements were also approved at MSC 81. These lay out the LRIT system

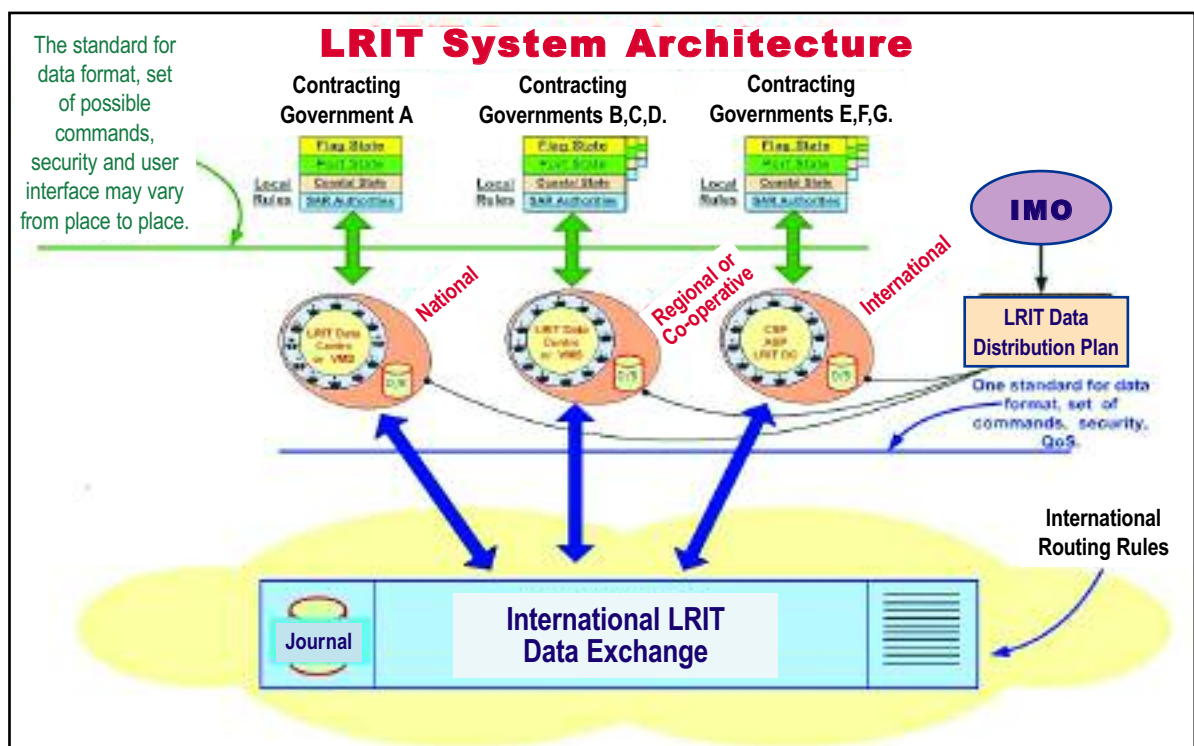


Figure 2: LRIT system architecture. Graphic courtesy of IMO.

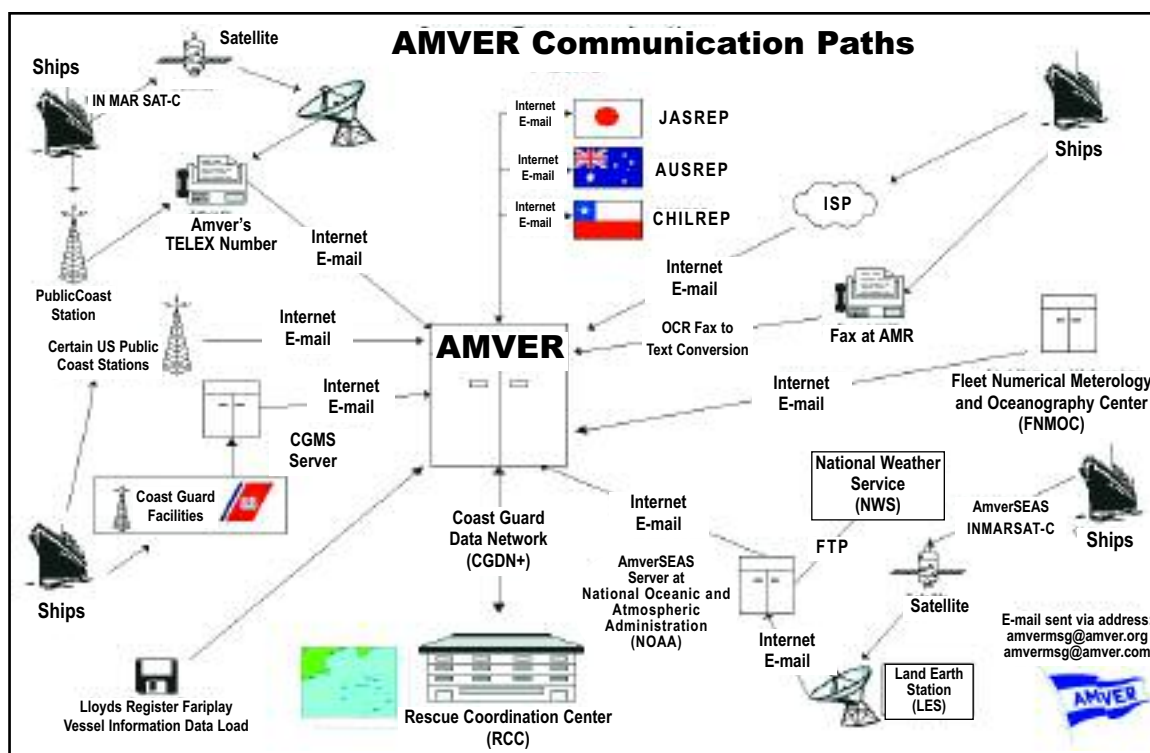


Figure 3: AMVER communication paths. USCG graphic.

architecture (Figure 2) and describe how the long-range identification and tracking system will work.

In this architecture, the administration determines whether its ships will report to a national, regional/cooperative, or the international LRIT data center. Each of these types of centers may use multiple communications service providers. The architecture is also designed to accommodate multiple application service providers. There are a number of existing ship reporting or vessel monitoring systems that may be able to function as national LRIT data centers within the LRIT system architecture. Examples of these data centers include the Amver (Figure 3); Victoria (the Russian Federation's real-time vessel monitoring system); the General Information Center On Maritime Safety and Security (Republic of Korea Ship Reporting System); and the Australian Ship Reporting System (AUSREP).

In the 16 May 2006 edition of *Lloyd's List*, an article entitled "Long-range Eyesight" noted that LRIT "can offer considerable impact in a safety role for any coastal state being able to oversee shipping far beyond its territorial seas. Anyone who doubts this should look at the excellent voluntary scheme operated by the U.S. Coast Guard, which, over decades, has saved many lives."¹¹ Although not stated explicitly in the article, it is referring to Amver. Back in February 2005, at the ninth session of IMO's Radiocommunications and Search & Rescue sub-

committee (COMSAR), the United States had offered an Amver-like system to serve as the international LRIT data center when the envisioned long-range identification and tracking architecture was wholly centralized.¹² With the distributed nature of the approved architecture, a national LRIT data center based upon the Amver model may still be a viable option.

Engineering Aspects of LRIT

MSC 81 established an ad hoc working group on the engineering aspects of LRIT¹³ and directed it to take into account the adopted SOLAS regulation V/19-1 and the related performance standards and functional requirements and report back to MSC 82 in November 2006 with the technical details needed for successful implementation of LRIT. This group will be developing technical specifications for the international LRIT data center and data exchange, as well as for communications within the LRIT system network. These include communications between LRIT data centers and the data exchange, in accordance with the long-range identification and tracking data distribution plan.

The group will be describing what happens in the internet "cloud" in Figure 4. The zones pictured refer to geographic regions associated with coastal states. The group will also develop protocols for development testing of the LRIT system and for testing the integration of new LRIT data centers into the system.

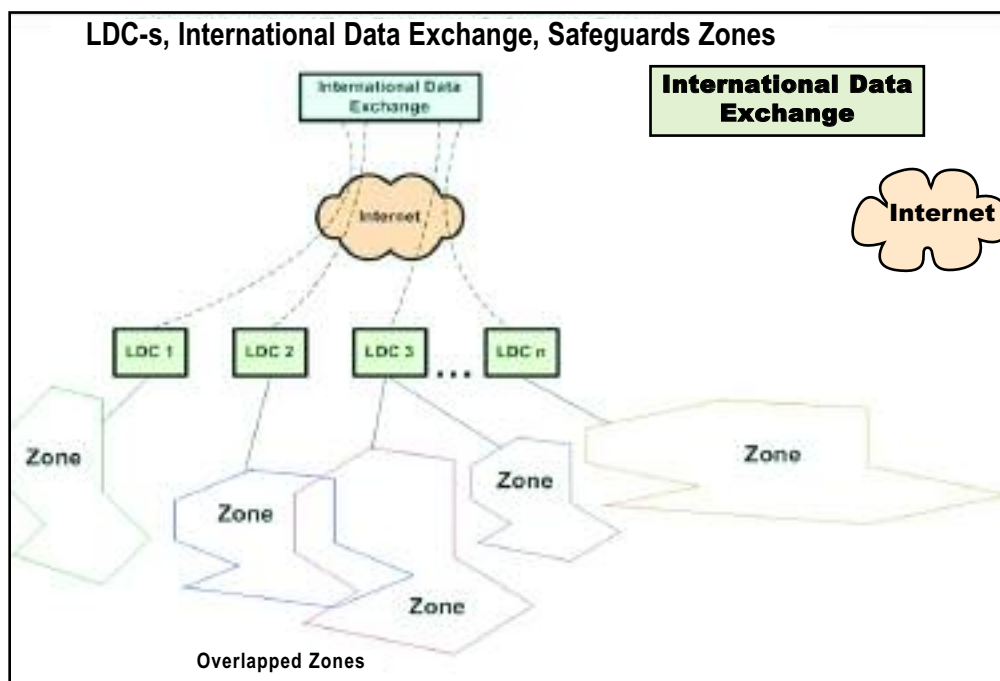


Figure 4. LRIT data networking. Graphic courtesy of Morsviazsputnik.

U.S. National Regulations for Implementing LRIT

In April 2006, the U.S. Coast Guard published in the *Federal Register* a notice of its plans for a rulemaking that would require, consistent with international law, certain vessels to report identity and position data electronically. These requirements would better enable the Coast Guard to correlate long-range identification and tracking data with data from other sources, detect anomalies, and heighten our overall Maritime Domain Awareness (MDA).¹⁴

The United States plans to issue a notice of proposed rulemaking and is expected to have SOLAS implementing regulations in place in time for the entry into force of the SOLAS regulation.

Under the existing domestic authority, principally §§ 70114 and 70115 of the "Maritime Transportation Security Act," and the "Ports and Waterways Safety Act," the Coast Guard could proceed with the establishment of a long-range identification and tracking system for the United States before the SOLAS amendment entry into force. This would be an option to get some early experience with LRIT.

To improve maritime security in the near term, USCG could also pursue voluntary LRIT. Ships subject to SOLAS and fitted with Global Maritime Distress and Safety Inmarsat-C equipment should have the capability to report position information. Many already use this capability or other satellite communications, e.g. fleet management systems, to

report position and other information to shoreside agents and owners. Ship owners could be asked to voluntarily make their position information available to the Coast Guard electronically through auto-forwarding of emails detailing the positions of ships of their fleet. This voluntary approach could be implemented with relative ease and in a short timeframe.

Analysis of Alternatives

The U.S. Coast Guard Operations Systems Center, near Martinsburg, W.Va., is conducting a study to investigate and assess existing tracking methods currently in use, including Amver, fleet man-

agement systems, automatic identification systems, and fisheries vessel monitoring systems. The USCG program managers for LRIT, MDA, and Search and Rescue are participating in the OSC study with a view toward a national plan for the implementation of LRIT in the United States.

Through the use of technologies such as long-range identification and tracking established in SOLAS, coupled with national regulations and voluntary participation from ship owners and operators, the U.S. Coast Guard is striving to improve its Maritime Domain Awareness for the purposes of safety, security, and environmental protection.

About the author: Mr. William R. Cairns is principal engineer for long-range identification and tracking in the Waterways Management Directorate at U.S. Coast Guard Headquarters. He has served on U.S. delegations to the IMO Maritime Safety Committee and NAV and COMSAR subcommittees. He was coordinator of the COMSAR correspondence group on LRIT and is U.S. member of the ad hoc working group on engineering aspects of LRIT. He is chairman of the new IALA e-navigation committee and a fellow, Royal Institute of Navigation.

ENDNOTES

- ¹ IMO MSC 81/WP.5/Add.1 Annex 1.
- ² IMO MSC 81/WP.5/Add.1 Annex 2.
- ³ IMO Diplomatic Conference 2002, Resolution 10.
- ⁴ IMO MSC 81/WP.5/Add.1 Annex 1, 2.
- ⁵ IMO MSC 81/WP.5/Add.1 Annex 1, para 4.1.
- ⁶ IMO MSC 81/WP.5/Add.1 Annex 1, para 4.2.
- ⁷ IMO MSC 81/WP.5/Add.1 Annex 1, para. 8.1.3.
- ⁸ IMO Circular Letter No. 2595 of 10 November 2004.
- ⁹ IMO MSC 81/WP.5/Add.1 Annex 1 para 1.
- ¹⁰ IMO MSC 81/WP.5/Add.1 Annex 1 para. 12.
- ¹¹ Lloyd's List, 16 May 2006.
- ¹² IMO COMSAR 9/12/8.
- ¹³ IMO MSC 81/WP.5/Add.1 Annex 4.
- ¹⁴ 71 FR 22688, April 24, 2006.



Coast Guard Petty Officer 3rd Class Chris Taylor and his boat crew patrol the waters surrounding the Statue of Liberty. U.S. Coast Guard photo by PA3 Dan Bender.